

Direct Photon-Hadron Correlations Measured with the PHENIX Detector

Megan Connors^a for the PHENIX Collaboration

^a Department of Physics and Astronomy, Stony Brook University
Stony Brook, NY 11794, USA

Contact e-mail: *mjuszkie@skipper.physics.sunysb.edu*

Direct photon-hadron correlations greatly improve our ability to perform jet tomography in heavy-ion collisions because the momentum of the direct photon can be used to constrain the initial momentum of the opposing jet. By comparing the spectra of away-side particles observed in heavy ion collisions to the spectra seen in nucleon collisions we can quantify the medium modifications to the fragmentation function due to energy loss of the away-side parton.

High p_T direct photon-hadron correlations have been measured by the PHENIX detector using a statistical subtraction method to remove the photon contribution from meson decays. Previous results from this method were limited by large uncertainties. However the systematic uncertainties can be reduced by applying event by event techniques to remove the decay background. Furthermore, the increased integrated luminosity in the most recent Au+Au RHIC run at $\sqrt{s_{NN}} = 200$ GeV provides substantially improved statistical precision and enhances the kinematic reach. These measurements are compared to PHENIX p+p results to probe the modification of the away-side spectra. An initial study of photon-hadron correlations in d+Au collisions looking for cold nuclear effects and as another baseline comparison for the Au+Au results is underway.